Name:

Date:

Is there a relationship between average SAT score and percent of students taking the SAT? Create a visual representation of the following data of average SAT score by state from 2014.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **State** | **Participation (%)** | **Reading** | **Math** | **Writing** | **Total** |
| Alabama | 7 | 547 | 538 | 532 | 1617 |
| Alaska | 54 | 507 | 503 | 475 | 1485 |
| Arizona | 36 | 522 | 525 | 500 | 1547 |
| Arkansas | 4 | 573 | 571 | 554 | 1698 |
| California | 60 | 498 | 510 | 496 | 1504 |
| Colorado | 14 | 582 | 586 | 567 | 1735 |
| Connecticut | 88 | 507 | 510 | 508 | 1525 |
| Delaware | 100 | 456 | 459 | 444 | 1359 |
| DC | 100 | 440 | 438 | 431 | 1309 |
| Florida | 72 | 491 | 485 | 472 | 1448 |
| Georgia | 77 | 488 | 485 | 472 | 1445 |
| Hawaii | 63 | 484 | 504 | 472 | 1460 |
| Idaho | 100 | 458 | 45456 | 450 | 1364 |
| Illinois | 5 | 599 | 616 | 587 | 1802 |
| Indiana | 71 | 497 | 500 | 477 | 1474 |
| Iowa | 3 | 605 | 611 | 578 | 1794 |
| Kansas | 5 | 591 | 596 | 566 | 1753 |
| Kentucky | 5 | 589 | 585 | 572 | 1746 |
| Louisiana | 5 | 561 | 556 | 550 | 1667 |
| Maine | 96 | 467 | 471 | 449 | 1387 |
| Maryland | 78 | 492 | 495 | 481 | 1468 |
| Massachusetts | 84 | 516 | 531 | 509 | 1556 |
| Michigan | 4 | 593 | 610 | 581 | 1784 |
| Minnesota | 6 | 598 | 610 | 578 | 1786 |
| Mississippi | 3 | 583 | 566 | 565 | 1714 |
| Missouri | 4 | 595 | 597 | 579 | 1771 |
| Montana | 18 | 555 | 552 | 530 | 1637 |
| Nebraska | 4 | 589 | 587 | 569 | 1745 |
| Nevada | 54 | 495 | 494 | 469 | 1458 |
| New Hampshire | 70 | 524 | 530 | 512 | 1566 |
| New Jersey | 79 | 501 | 523 | 502 | 1526 |
| New Mexico | 12 | 548 | 543 | 526 | 1617 |
| New York | 76 | 488 | 502 | 478 | 1468 |
| North Carolina | 65 | 499 | 507 | 477 | 1483 |
| Ohio | 15 | 555 | 562 | 535 | 1652 |
| Oklahoma | 5 | 576 | 571 | 550 | 1697 |
| Oregon | 48 | 523 | 522 | 499 | 1544 |
| Pennsylvania | 71 | 497 | 504 | 480 | 1481 |
| Rhode Island | 73 | 497 | 496 | 487 | 1480 |
| South Carolina | 65 | 488 | 490 | 465 | 1443 |
| South Dakota | 3 | 604 | 609 | 579 | 1792 |
| Tennessee | 8 | 578 | 570 | 566 | 1714 |
| Texas | 62 | 476 | 495 | 461 | 1432 |
| Utah | 5 | 571 | 568 | 551 | 1690 |
| Vermont | 63 | 522 | 525 | 507 | 1554 |
| Virginia | 73 | 518 | 515 | 497 | 1530 |
| Washington | 63 | 510 | 518 | 491 | 1519 |
| West Virginia | 15 | 517 | 505 | 500 | 1522 |
| Wisconsin | 4 | 596 | 608 | 578 | 1782 |
| Wyoming | 3 | 590 | 599 | 573 | 1762 |

Source: College board <http://blog.prepscholar.com/average-sat-scores-by-state-most-recent>

Complete the following:

1. Identify one explanatory and one response variable.
2. Create a scatterplot to illustrate the relationship between the two variables.
3. Describe your scatterplot using *direction, form* and *strength.*
4. Calculate the correlation between the two variables.
5. Tell what the correlation tells you about the relationship between your variables.
6. Calculate the regression line.
7. Interpret the slope.
8. Interpret the y-intercept.
9. Choose two points not on the line.
   1. Use your regression line to predict a y-value for each of the x-values you have chosen.
   2. Find the **residual** of each point.
10. Write at least one or two sentences telling what you concluded about the relationship between the two variables.